

The NOAA-USGS Geoelectric Field Modeling Project: mitigating the impacts of space weather on the nation's electric power grid

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Geomagnetic storms are a particular kind of space weather that induce electrical current into artificial conductors on the surface of the earth such as the electrical power grid. For many years NOAA's Space Weather Prediction Center has supported the industry through legacy geomagnetic indices which provide only a general indication of activity levels but do not tell users where to expect the largest impacts and do not provide a direct causal link between the activity and the effect. In recent years the Space Weather Prediction Center has partnered with the U.S. Geological Survey and other subject matter experts to develop real-time geoelectric field maps. These geoelectric field maps combine information about regional geomagnetic field variations with earth conductivity structure to estimate regional geoelectric fields, which in turn are the direct drivers of these geomagnetically induced currents. In this talk we provide background on how this new user requirement was initially identified, how the calculations work and show examples of the real-time map products which recently have transitioned to operations at NOAA/SWPC.